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Notice of Allowability	Application No.	Applicant(s)	
	10/708,911	STRICKER ET AL.	
	Examiner	Art Unit	
	Boris Benenson	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 3/31/2004.
2. ☒ The allowed claim(s) is/are 1-40.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date <u>7/15/2004</u> | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

Detailed Actions

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

In the Specification on Page 5 line 19 after "relationship between" insert - BVceo and Masked Subcollector Pullback Distance and Fig.12B is a plot illustrating the relationship between--.

Allowable Subject Matter

2. Claims 1-40 are allowed.

The following is an examiner's statement of reasons for allowance:

3. Independent Claim 1 is allowable because none of the prior art of record disclose an electrostatic discharge protection circuit comprising a bipolar transistor coupled between two circuit nodes having a non-uniform subcollector region geometry wherein the bipolar transistor having different value for collector to emitter breakdown voltage than identical bipolar transistor having a uniform subcollector region geometry.

4. Independent Claim 21 is allowable because none of the prior art of record disclose a method of providing an electrostatic discharge protection to an integrated circuit comprising a step of providing a first bipolar transistor coupled between a first and a second circuit nodes, wherein the first bipolar transistor having a non-uniform subcollector region geometry and a step of selecting the non-uniform subcollector region geometry to tune a collector to emitter breakdown voltage of the first bipolar transistor.

5. Independent Claim 39 is allowable because none of the prior art of record disclose a method of designing an electrostatic discharge protection circuit comprising a step of accepting a

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value for collector to emitter breakdown voltage target for a first bipolar transistor of the circuit and a step for selecting a non-uniform subcollector region geometry for the first bipolar transistor based on the breakdown voltage target.

Claims 2-20, 22-38 and 40 are dependent on allowable claims and therefore allowable.

Prior Art

6. US Patent (6,878,976) titled "Carbon-modulated breakdown voltage SiGe transistor for low voltage trigger ESD applications" disclosed a way to control collector-to-emitter breakdown voltage of the transistor by controlling a carbon implant at a location of collector to modulate a redistribution of the n-type dopant in a region proximate to the base-collector region of the transistor, thereby lowering a collector-to-emitter breakdown voltage of the transistor.

US Patent (6,720,637) discussed a way to increase collector-to-emitter breakdown voltage of a transistor by providing a varactor structure into a structure of the transistor.

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None of prior art of the record disclosed non-uniform geometry of the subcollector as a way to control collector-to-emitter breakdown voltage of a transistor in ESD applications.

Comments to reasons for allowance

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact information


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Boris Benenson whose telephone number is (571) 272-2048. The examiner can normally be reached on M-F (8:20-6:00) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (571) 272-2800 ext 36. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Boris Benenson
Examiner
Art Unit 2836

B.B.



BRIAN SIRCUS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER